Changes for the Better

MITSUBISHI ELECTRIC

AIR CONDITIONERS CITY MULTI

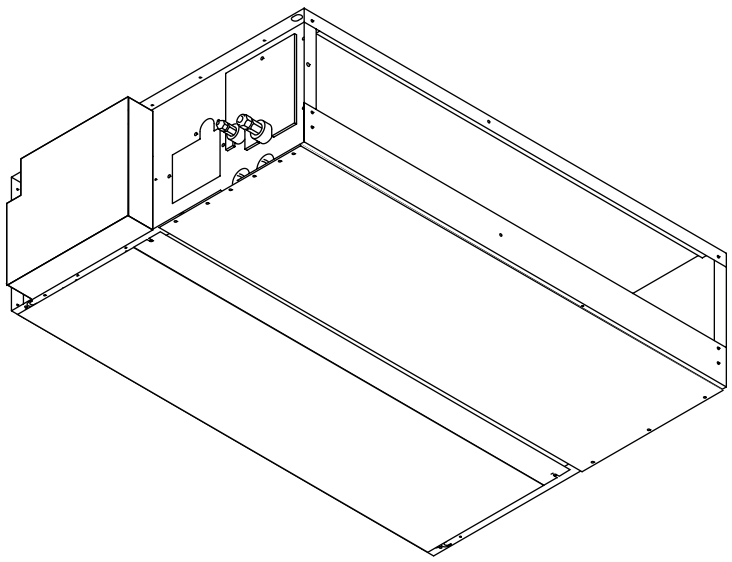
2005

TECHNICAL & SERVICE MANUAL

Series PDFY Ceiling Concealed Built-in

<Indoor unit>

Models **PDFY-P06NMU-E,PDFY-P08NMU-E**
PDFY-P12NMU-E,PDFY-P15NMU-E
PDFY-P18NMU-E,PDFY-P24NMU-E
PDFY-P27NMU-E,PDFY-P30NMU-E
PDFY-P36NMU-E,PDFY-P48NMU-E



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CITY MULTI

For use with the R410A & R22

SAFETY PRECAUTIONS

1. Before installation and electric work

- **Before installing the unit, make sure you read all the "Safety precautions".**
- **The "Safety precautions" provide very important points regarding safety. Make sure you follow them.**
- **This equipment may not be applicable to EN61000-3-2: 1995 and EN61000-3-3: 1995.**
- **This equipment may have an adverse effect equipment on the same electrical supply system.**
- **Please report to or take consent by the supply authority before connection to the system.**

Symbols used in the text

⚠Warning:
Describes precautions that should be observed to prevent danger of injury or death to the user.

⚠Caution:
Describes precautions that should be observed to prevent damage to the unit.

Symbols used in the illustrations

⃠ : Indicates an action that must be avoided.

❗ : Indicates that important instructions must be followed.

⏚ : Indicates a part which must be grounded.

: Indicates that caution should be taken with rotating parts. (This symbol is displayed on the main unit label.) <Color: Yellow>

: Beware of electric shock (This symbol is displayed on the main unit label.) <Color: Yellow>

⚠Warning:
Carefully read the labels affixed to the main unit.

⚠Warning:

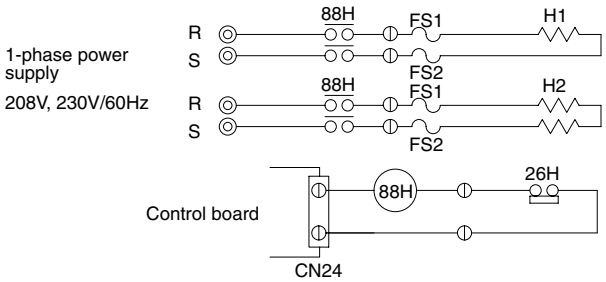
- **Ask the dealer or an authorized technician to install the air conditioner.**
  - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the air unit at a place that can withstand its weight.**
  - Inadequate strength may cause the unit to fall down, resulting in injuries.
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
  - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for typhoons and other strong winds and earthquakes and install the unit at the specified place.**
  - Improper installation may cause the unit to topple and result in injury.
- **Always use an air cleaner, humidifier, electric heater, and other accessories specified by Mitsubishi Electric.**
  - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
  - If the unit is repaired improperly, water leakage, electric shock, or fire may result.
- **Do not touch the heat exchanger fins.**
  - Improper handling may result in injury.
- **When handling this product, always wear protective equipment. EG : Gloves, full arm protection namely boiler suit, and safety glasses.**
  - Improper handling may result in injury.
- **If refrigerant gas leaks during installation work, ventilate the room.**
  - If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- **Install the air conditioner according to this Installation Manual.**
  - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations"and the instructions given in this manual and always use a special circuit.**
  - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Securely install the cover of control box and the panel.**
  - If the cover and panel are not installed properly, dust or water may enter the outdoor unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge the it with a refrigerant different from the refrigerant (R22) specified on the unit.**
  - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
  - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
  - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.
- **After completing installation work, make sure that refrigerant gas is not leaking.**
  - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.
- **Do not reconstruct or change the settings of the protection devices.**
  - If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.

⚠ Warning:

- **Note the following when building a heater in the air conditioning system.**
  - Leave enough space between units for proper ventilation so that the indoor unit temperature does not exceed 40˚C when windless.
  - Keep the heater clean, and take appropriate measures so that the indoor unit does not suck in the dust particles that accumulate on the heater.
  - Use the optional heater cable (PAC-YU24HT) to perform an interlocked operation with indoor units.
  - Do not build a heater inside the indoor unit.

Recommended circuit

Wiring diagram



FS1, 2 ----- Thermal fuse

H1, H2 ----- Heater

26H --------- Overheat protection thermostat

88H --------- Electromagnetic contactor

2. Precautions for devices that use R410A refrigerant

⚠ Caution:

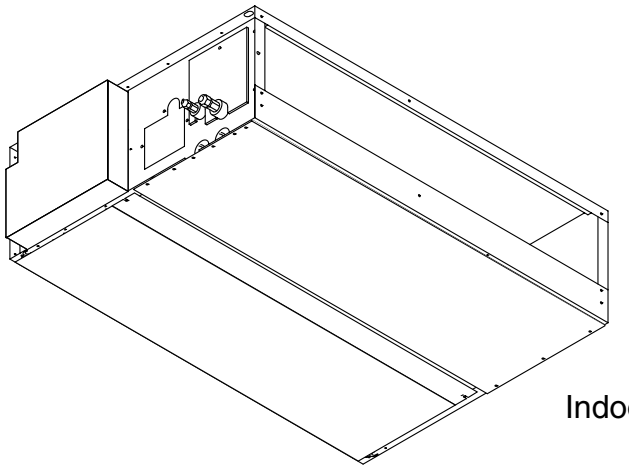
- **Do not use the existing refrigerant piping.**
  - The old refrigerant and refrigerator oil in the existing piping contains a large amount of chlorine which may cause the refrigerator oil of the new unit to deteriorate.
- **Use refrigerant piping made of C1220 (Cu-DHP) phosphorus deoxidized copper as specified in the *JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
  - Contaminants on the inside of the refrigerant piping may cause the refrigerant residual oil to deteriorate.

  *JIS: Japanese Industrial Standard
- **Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)**
  - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor trouble may result.
- **Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections.**
  - The refrigerator oil will degrade if it is mixed with a large amount of mineral oil.
- **Use liquid refrigerant to fill the system.**
  - If gas refrigerant is used to seal the system, the composition of the refrigerant in the cylinder will change and performance may drop.
- **Do not use a refrigerant other than R410A.**
  - If another refrigerant (R22, etc.) is used, the chlorine in the refrigerant may cause the refrigerator oil to deteriorate.
- **Use a vacuum pump with a reverse flow check valve.**
  - The vacuum pump oil may flow back into the refrigerant cycle and cause the refrigerator oil to deteriorate.
- **Do not use the following tools that are used with conventional refrigerants.**

  (Gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, refrigerant recovery equipment)
  - If the conventional refrigerant and refrigerator oil are mixed in the R410A, the refrigerant may deteriorated.
  - If water is mixed in the R410A, the refrigerator oil may deteriorate.
  - Since R410A does not contain any chlorine, gas leak detectors for conventional refrigerants will not react to it.
- **Do not use a charging cylinder.**
  - Using a charging cylinder may cause the refrigerant to deteriorate.
- **Be especially careful when managing the tools.**
  - If dust, dirt, or water gets in the refrigerant cycle, the refrigerant may deteriorate.

1 FEATURES

Series PDFY Ceiling Concealed Built-in

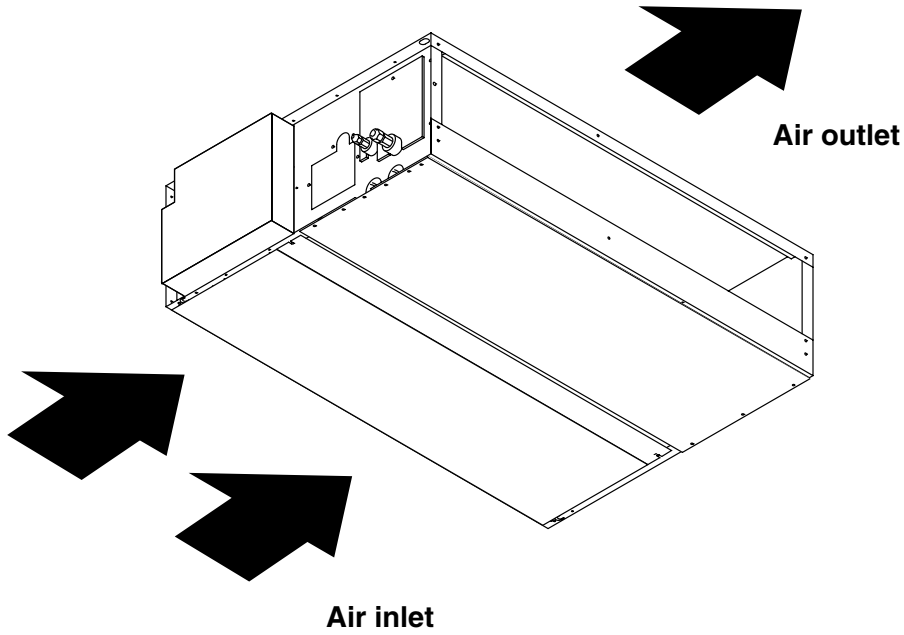


Indoor unit

Models	Cooling capacity/Heating capacity	
	kW	Btu / h
PDFY-P06NMU-E	1.8 / 2.0	6000 / 6700
PDFY-P08NMU-E	2.3 / 2.6	8000 / 9000
PDFY-P12NMU-E	3.5 / 4.0	12000 / 13500
PDFY-P15NMU-E	4.4 / 5.0	15000 / 17000
PDFY-P18NMU-E	5.3 / 5.9	18000 / 20000
PDFY-P24NMU-E	7.0 / 7.9	24000 / 27000
PDFY-P27NMU-E	7.9 / 8.8	27000 / 30000
PDFY-P30NMU-E	8.8 / 10.0	30000 / 34000
PDFY-P36NMU-E	10.6 / 11.7	36000 / 40000
PDFY-P48NMU-E	14.1 / 15.8	48000 / 54000

2 PART NAMES AND FUNCTIONS

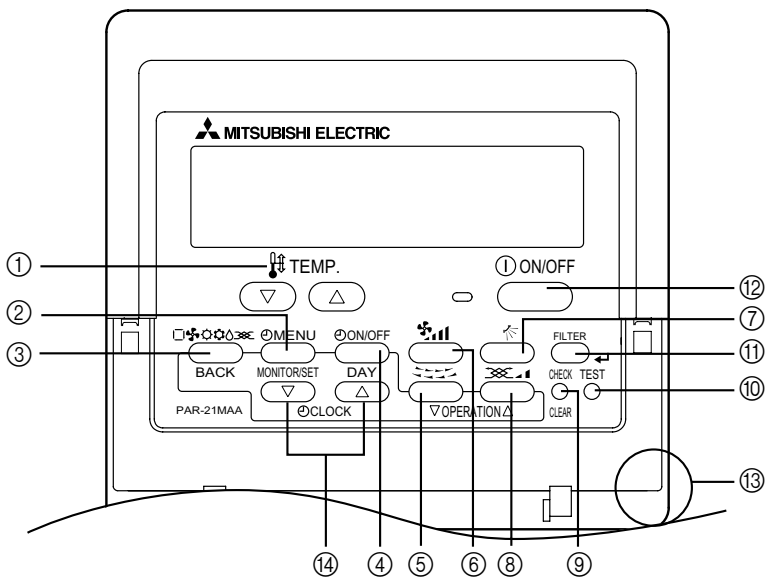
● **Indoor (Main) Unit**



● **Remote controller** **[PAR-21MAA]**

● Once the controls are set, the same operation mode can be repeated by simply pressing the ON/OFF button.

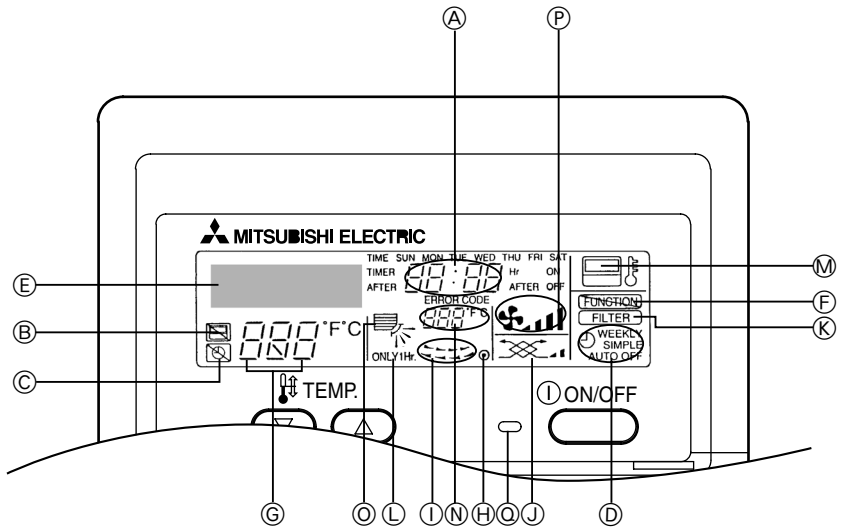
● **Operation buttons**



① [Set Temperature] Button
② [Timer Menu] Button
[Monitor/Set] Button
③ [Mode] Button
[Return] Button
④ [Timer On/Off] Button
[Set Day] Button
⑤ [Louver] Button
[Operation] Button
⑥ [Fan Speed] Button
⑦ [Airflow Up/Down] Button
⑧ [Ventilation] Button
[Operation] Button
⑨ [Check/Clear] Button
⑩ [Test run] Button
⑪ [Filter] Button
[↵] Button
⑫ [ON/OFF] Button
⑬ Position of built-in room temperature
⑭ [Set Time] Button

- Never expose the remote controller to direct sunlight. Doing so can result in the erroneous measurement of room temperature.
- Never place any obstacle around the lower right-hand section of the remote controller. Doing so can result in the erroneous measurement of room temperature.

[Display]



Ⓐ Current time/Timer
Ⓑ Centralized control
Ⓒ Timer OFF
Ⓓ Timer indicator
Ⓔ Operation mode: ☼COOL, ◊DRY, ▭AUTO, ✣FAN, ☼HEAT
Ⓕ “Locked” indicator
Ⓖ Set temperature
Ⓗ Power ON
Ⓘ Louver
Ⓙ Ventilation
Ⓚ Filter sign
Ⓛ Set effective for 1 hr.
Ⓜ Sensor position
Ⓝ Room temperature
Ⓞ Airflow
Ⓟ Fan speed

3 SPECIFICATION

3-1. Specification

PDFY-P-NMU-E

Item \ Model				PDFY-P06NMU-E	PDFY-P08NMU-E	PDFY-P12NMU-E	PDFY-P15NMU-E	PDFY-P18NMU-E
Power sourse				208/230V, 60Hz				
Capacity *1	Cooling	kW		1.8	2.3	3.5	4.4	5.3
		BTU/h		6000	8000	12000	15000	18000
	Heating	kW		2.0	2.6	4.0	5.0	5.9
		BTU/h		6700	9000	13500	17000	20000
Dimension	Height	mm		295				
		in		11-5/8				
	Width	mm		710			960	
		in		27-31/32			37-13/16	
	Depth	mm		735				
		in		28-15/16				
Net weight		kg		26	26	27	32	34
		lb		57	57	60	71	75
FAN	Airflow rate (Low-(Middle2-Middle1-) High)	m^3/min		6.0-6.5-7.5-8.5	6.0-6.5-7.5-8.5	6.0-6.5-7.5-8.5	10.0-11.0-12.5-14.0	10.0-11.0-12.5-14.0
		cfm		211-229-264-300	211-229-264-300	211-229-264-300	353-388-441-494	353-388-441-494
	External static pressure *3	Pa	208V	30-50-80	30-50-80	30-50-80	30-50-80	30-50-80
			230V	40-60-100	40-60-100	40-60-100	40-60-100	40-60-100
Noise level (Low-(Middle2-Middle1-) High) *2		dB(A)	208V	26-28-31-34	26-28-31-34	26-28-31-34	32-34-35-37	32-34-35-37
			230V	28-30-33-36	28-30-33-36	28-30-33-36	34-36-37-39	34-36-37-39
Filter				Standard filter				

PDFY-P-NMU-E

Item \ Model				PDFY-P24NMU-E	PDFY-P27NMU-E	PDFY-P30NMU-E	PDFY-P36NMU-E	PDFY-P48NMU-E
Power sourse				208/230V, 60Hz				
Capacity *1	Cooling	kW		7.0	7.9	8.8	10.6	14.1
		BTU/h		24000	27000	30000	36000	48000
	Heating	kW		7.9	8.8	10.0	11.7	15.8
		BTU/h		27000	30000	34000	40000	54000
Dimension	Height	mm		295			335	
		in		11-5/8			13-7/32	
	Width	mm		1160			1510	
		in		45-11/16			59-15/32	
	Depth	mm		735			775	
		in		28-15/16			30-17/32	
Net weight		kg		39	39	39	52	52
		lb		86	86	86	115	115
FAN	Airflow rate (Low-(Middle2-Middle1-) High)	m^3/min		12.5-14.0-16.0-18.0	13.5-15.5-17.5-19.5	14.0-16.5-18.5-21.0	19.5-28.0	24-34
		cfm		441-494-565-635	477-547-618-689	494-582-653-741	688-988	847-1200
	External static pressure *3	Pa	208V	30-50-80	30-50-80	30-50-100	50-100-130	50-100-130
			230V	40-60-100	40-60-100	40-60-115	60-115-150	60-115-150
Noise level (Low-(Middle2-Middle1-) High) *2		dB(A)	208V	28-32-34-37	31-35-37-40	32-35-38-40	36-44	42-46
			230V	30-34-36-39	32-36-38-40	34-37-40-42	38-45	43-47
Filter				Standard filter				

Notes: *1 Cooling/Heating capacity indicates the maximum value at operation under the following condition.
Cooling: Indoor: 26.7 ˚C [80 ˚F] DB/19.4 ˚C [67 ˚F] WB Outdoor: 35 ˚C [95 ˚F] DB
Heating: Indoor: 21.1 ˚C [70 ˚F] DB Outdoor: 8.3 ˚C [47 ˚F] DB/6.1 ˚C [43 ˚F] WB
*2 The operating noise is the data that was obtained in an anechoic room.
*3 As for the factory setting is below.

PDFY-P-NMU-E series

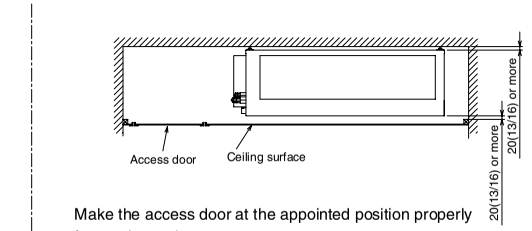
PDFY-P06NMU-E		PDFY-P08NMU-E		PDFY-P12NMU-E		PDFY-P15NMU-E		PDFY-P18NMU-E	
208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
50	60	50	60	50	60	50	60	50	60

PDFY-P24NMU-E		PDFY-P27NMU-E		PDFY-P30NMU-E		PDFY-P36NMU-E		PDFY-P48NMU-E	
208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
50	60	50	60	50	60	50	60	50	60

3-2. Electrical parts specifications

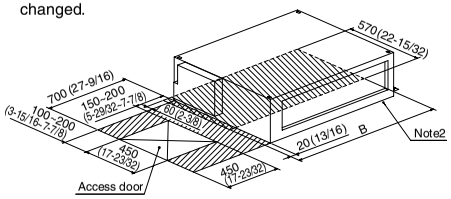
Parts name \ Model	Symbol	PDFY-P06,08,12 NMU-E	PDFY-P15,18 NMU-E	PDFY-P24,27 NMU-E	PDFY-P30 NMU-E	PDFY-P36 NMU-E	PDFY-P48 NMU-E
Tranrsformer	T	(Primary) 240V 60Hz (Secondary) (23.5V 0.9A)					
Room temperature thermistor	TH21	Resistance 0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ					
Liquid pipe thermistor	TH22	Resistance 0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ					
Gas pipe thermistor	TH23	Resistance 0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ					
Fuse (Indoor controller board)	FUSE	250V 6.3A					
Fan motor (with Inner-thermostat)	MF1	4-pole Output 75W D104P75MW	4-pole Output 85W D104P85MW	4-pole Output 95W D104P95MW		4-pole Output 140W NC-100VM1	4-pole Output 190W NC-125VM1
Inner-thermostat (Fan motor)		OFF 130˚C±5˚C[266˚F±41˚F] ON 90˚C±20˚C[194˚F±68˚F]				OFF 150˚C±5˚C[302˚F±41˚F] ON 96˚C±15˚C[205˚F±59˚F]	
Fan motor capacitor	C1	3.0μF X 440V	5.0μF X 440V	6.0μF X 440V		5.0μF X 440V	8.0μF X 440V
Linear expansion valve	LEV	DC12V Stepping motor drive port dimension 3.2Ω (0~2000pulse) EDM-402MD			DC12V Stepping motor drive port dimension 5.2Ω (0~2000pulse) EDM-804MD		
Power supply terminal bed	TB2	(L1,L2,G) 330V 30A					
Transmission terminal bed	TB5 TB15	(1,2),(M1,M2,S) 330V 30A					

Note:1. Use M10 screw for the Suspension bolt (field supply).
2. On Model :18, you would use flare nut packed with the Indoor Unit, when connecting the Outdoor Unit for R22.

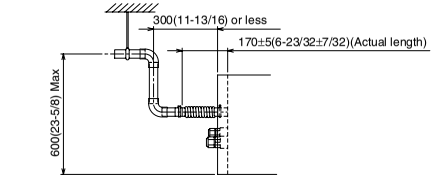


Make the access door at the appointed position properly for service maintenance.

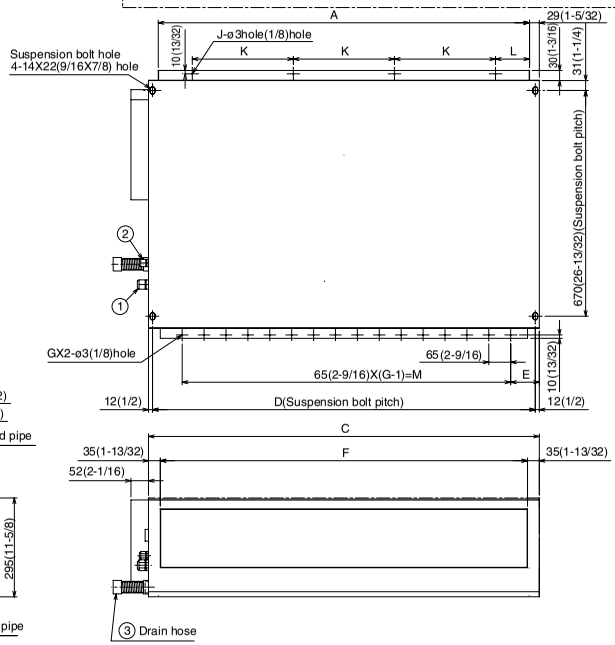
Required space for service and maintenance.
Keep the service space for the maitenance from the bottom when the heat exchenger is cleaned and fan motor or fan is changed.

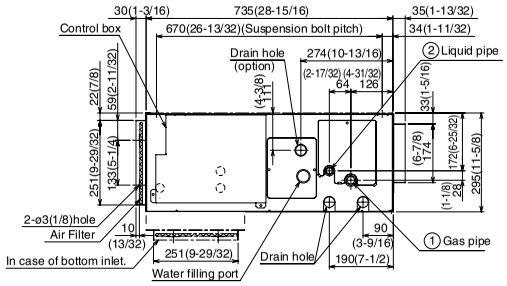


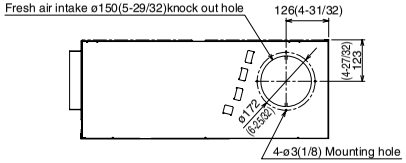
mm(in.)



When installing the drain water lifting-up mech(option).



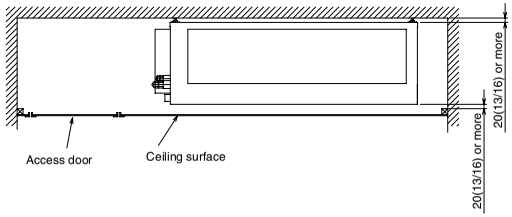




※1 :R410A outdoor unit
※2 :R22 outdoor unit
mm(in.)

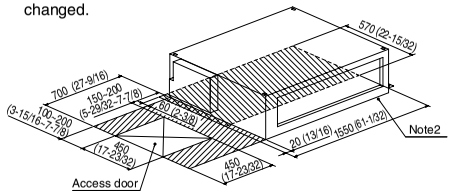
Model	A	B	C	D	E	F	G	J	K	L	M	①Gas pipe <flare>	②Liquid pipe <flare>	③Drain hose
PDFY-P06·08·12NMU-E	652 (25-11/16)	750 (29-17/32)	710 (27-31/32)	686 (27-1/32)	95 (3-3/4)	636 (25-1/16)	9	3	200 (7-7/8)	126 (4-31/32)	520 (20-15/32)	ø12.7(1/2)	ø6.35(1/4)	Drain hose 32mm(1-1/4inch) <flexible joint > (accessory)
PDFY-P15NMU-E	902 (35-17/32)	1000 (39-3/8)	960 (37-13/16)	936 (36-7/8)	90 (3-9/16)	886 (34-29/32)	13	3	300 (11-13/16)	151 (5-31/32)	780 (30-23/32)	ø12.7(1/2)	ø6.35(1/4)	
PDFY-P18NMU-E	902 (35-17/32)	1000 (39-3/8)	960 (37-13/16)	936 (36-7/8)	90 (3-9/16)	886 (34-29/32)	13	3	300 (11-13/16)	151 (5-31/32)	780 (30-23/32)	※1 ø12.7(1/2) ※2 ø15.88(5/8)	※1 ø6.35(1/4) ※2 ø9.52(3/8)	
PDFY-P24·27·30NMU-E	1102 (43-13/32)	1200 (47-1/4)	1160 (45-11/16)	1136 (44-3/4)	92.5 (3-21/32)	1086 (42-25/32)	16	4	300 (11-13/16)	101 (4)	975 (38-3/4)	ø15.88(5/8)	ø9.52(3/8)	

Note:1. Use M10 screw for the Suspension bolt (field supply).
2. On this model, you would use flare nut packed with the Indoor Unit, when connnecting the Outdoor Unit for R22.

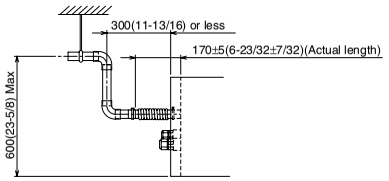


Make the access door at the appointed position properly for service maintenance.

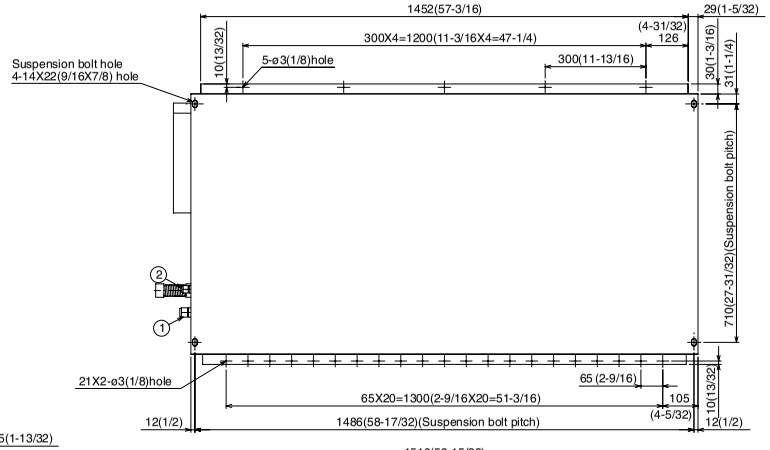
Required space for service and maintenance.
Keep the service space for the maitenance from the bottom when the heat exchenger is cleaned and fan motor or fan is changed.

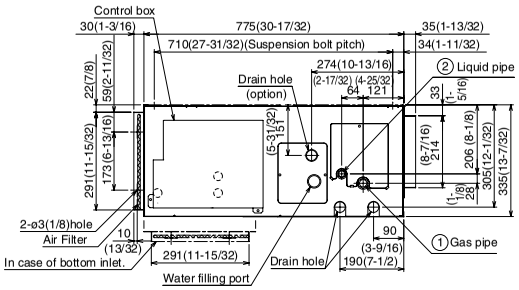


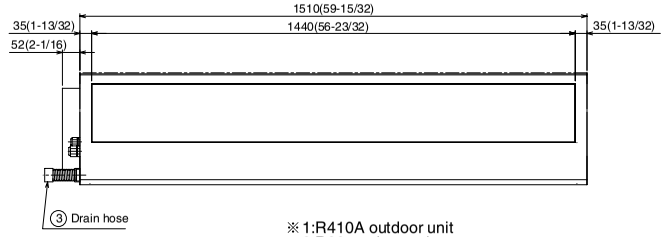
mm(in.)

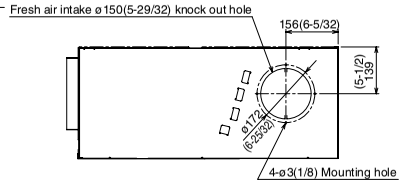


When installing the drain water lifting-up mech(option).







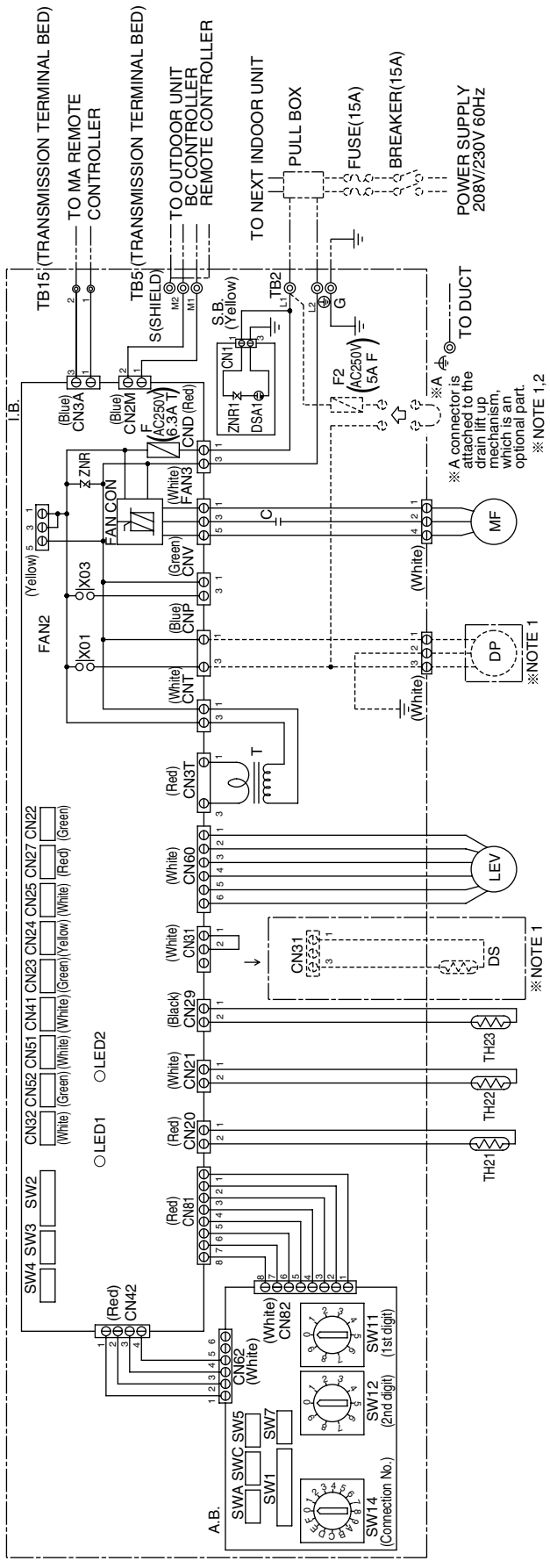


※1:R410A outdoor unit
※2:R22 outdoor unit mm(in.)

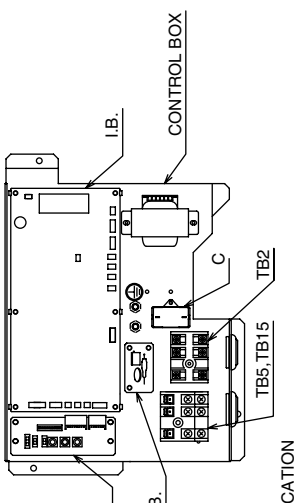
Model	①Gas pipe <flare>		②Liquid pipe <flare>	③Drain hose
PDFY-P36NMU-E	※1	ø15.88(5/8)	ø9.52(3/8)	Drain hose 32mm(1-1/4inch) <flexible joint > (accessory)
	※2	ø19.05(3/4)		
PDFY-P48NMU-E	※1	ø15.88(5/8)	ø9.52(3/8)	
	※2	ø19.05(3/4)		

5 WIRING DIAGRAM

PDFY-P06·08·12·15·18·24·27·30NMU-E



NOTE;1.The part of the broken line indicates the circuit for optional parts.
2.※A in the chart is the connector for a drain pump test run operation.
(The Drain Pump operates continuously if the connector is inserted and the power is supplied.)
After the test run, make sure to remove the ※A connector.
3.The wirings to TB2, TB5, TB15 shown in chained line are field work.
4.Mark◎indicates terminal bed, ⊖ connector, ▣board insertion connector or fastening connector of control board.



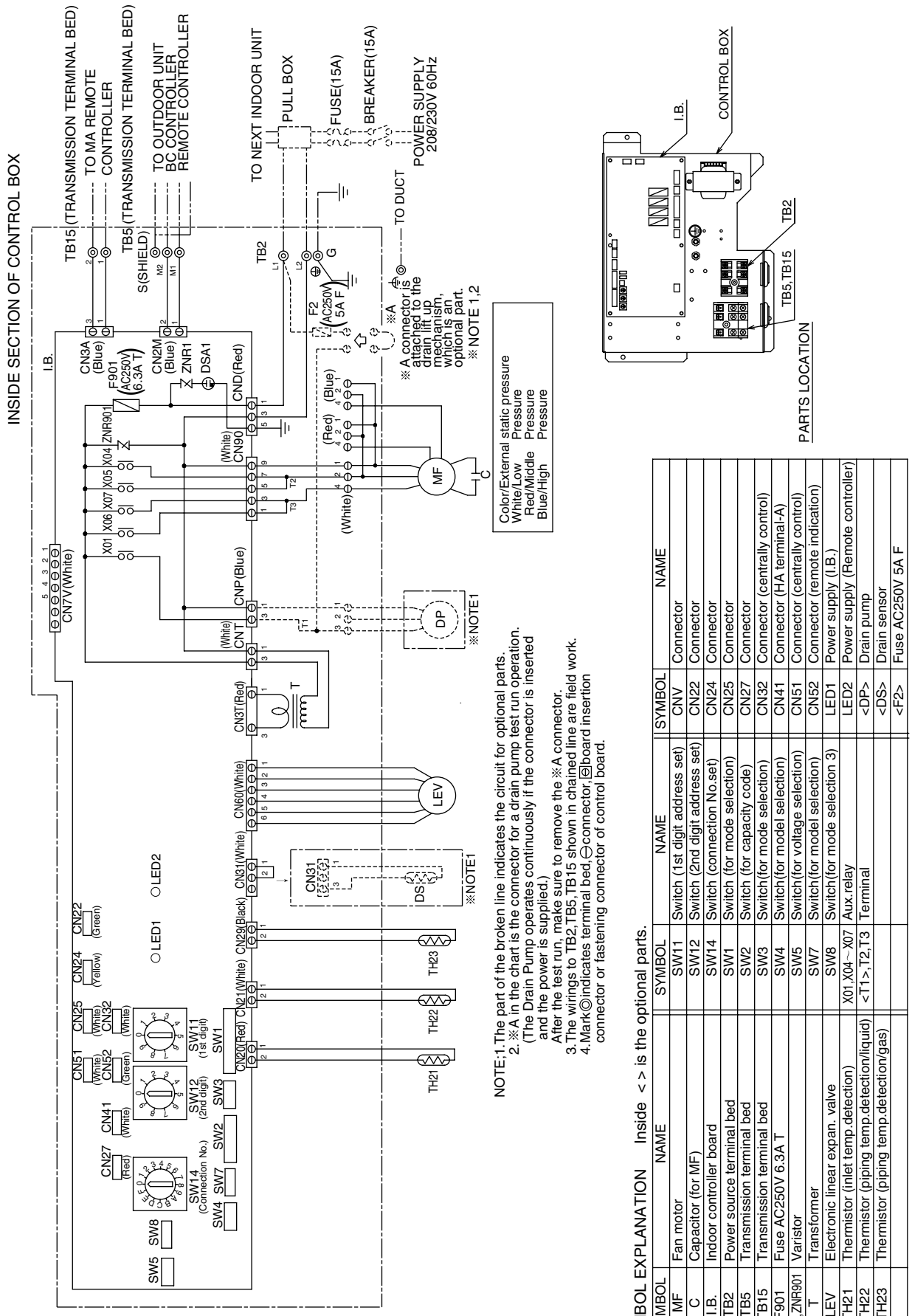
PARTS LOCATION

SYMBOL EXPLANATION

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
MF	Fan motor	TH21	Thermistor (inlet temp.detection)	X01,X03	Aux.relay
C	Capacitor (for MF)	TH22	Thermistor (piping temp.detection/liquid)	S.B.	Surge absorber board
I.B.	Indoor controller board	TH23	Thermistor (piping temp.detection/gas)	SWA(A.B.)	Switch (optional parts)
A.B.	Address board	LED1	Power supply (I.B.)	SWC(A.B.)	Switch (optional parts)
TB2	Power source terminal bed	LED2	Power supply (Remote controller)	SW11(A.B.)	Switch (1st digit address set)
TB5	Transmission terminal bed	CNV	Connector	SW12(A.B.)	Switch (2nd digit address set)
TB15	Transmission terminal bed	CN22	Connector	SW14(A.B.)	Switch (connection No.set)
F	Fuse AC250V 6.3A T	CN23	Connector	SW1(A.B.)	Switch(for mode selection)
<F2>	Fuse AC250V 5A F	CN24	Connector	SW5(A.B.)	Switch(for voltage selection)
T	Transformer	CN25	Connector	SW7(A.B.)	Switch(for model selection)
<DP>	Drain pump	CN27	Connector	SW2(I.B.)	Switch(for capacity code)
<DS>	Drain sensor	CN32	Connector (Centrally control)	SW3(I.B.)	Switch(for mode selection)
LEV	Electronic linear expan. valve	CN41	Connector (HA terminal-A)	SW4(I.B.)	Switch(for model selection)
ZNR,ZNR1	Varistor	CN51	Connector (Centrally control)		
		CN52	Connector (Remote indication)		

Inside < > is the optional parts.

PDFY-P36·48NMU-E

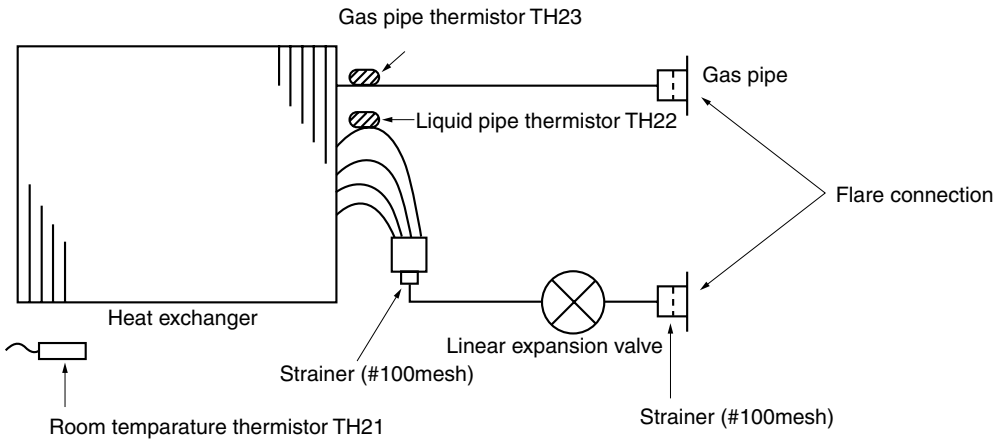


NOTE;1.The part of the broken line indicates the circuit for optional parts.
2. ※A in the chart is the connector for a drain pump test run operation.
(The Drain Pump operates continuously if the connector is inserted and the power is supplied.)
After the test run, make sure to remove the ※A connector.
3.The wirings to TB2,TB5,TB15 shown in chained line are field work.
4.Mark◎indicates terminal bed,⊖connector,▣board insertion connector or fastening connector of control board.

SYMBOL EXPLANATION Inside < > is the optional parts.

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
MF	Fan motor	SW11	Switch (1st digit address set)	CNV	Connector
C	Capacitor (for MF)	SW12	Switch (2nd digit address set)	CN22	Connector
I.B.	Indoor controller board	SW14	Switch (connection No.set)	CN24	Connector
TB2	Power source terminal bed	SW1	Switch (for mode selection)	CN25	Connector
TB5	Transmission terminal bed	SW2	Switch (for capacity code)	CN27	Connector
TB15	Transmission terminal bed	SW3	Switch(for mode selection)	CN32	Connector (centrally control)
F901	Fuse AC250V 6.3A T	SW4	Switch(for model selection)	CN41	Connector (HA terminal-A)
ZNR1,ZNR901	Varistor	SW5	Switch(for voltage selection)	CN51	Connector (centrally control)
T	Transformer	SW7	Switch(for model selection)	CN52	Connector (remote indication)
LEV	Electronic linear expan. valve	SW8	Switch(for mode selection 3)	LED1	Power supply (I.B.)
TH21	Thermistor (inlet temp.detection)	X01,X04～X07	Aux.relay	LED2	Power supply (Remote controller)
TH22	Thermistor (piping temp.detection/liquid)	<T1>,T2,T3	Terminal	<DP>	Drain pump
TH23	Thermistor (piping temp.detection/gas)			<DS>	Drain sensor
				<F2>	Fuse AC250V 5A F

6 REFRIGERANT SYSTEM DIAGRAM



mm <in.>

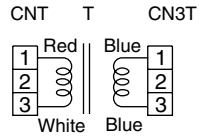
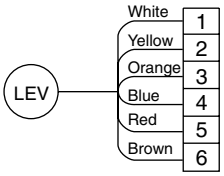
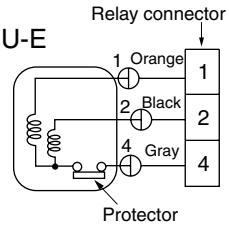
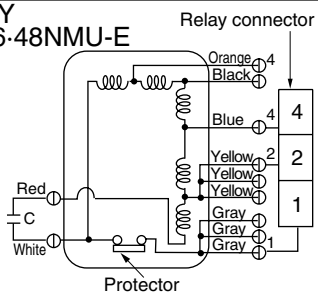
Item \ Capacity		PDFY-P06,08,12,15NMU-E	PDFY-P18NMU-E
Gas pipe	R410A	ø 12.7(1/2)	
	R22	ø 12.7(1/2)	ø 15.88(5/8)
Liquid pipe	R410A	ø 6.35(1/4)	
	R22	ø 6.35(1/4)	ø 9.52(3/8)

mm <in.>

Item \ Capacity		PDFY-P24,27,30NMU-E	PDFY-P36,48NMU-E
Gas pipe	R410A	ø 15.88(5/8)	
	R22	ø 15.88(5/8)	ø 19.05(3/4)
Liquid pipe	R410A	ø 9.52(3/8)	
	R22	ø 9.52(3/8)	

7 TROUBLE SHOOTING

7-1. How to check the parts

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temparature thermistor (TH21)
Liquid pipe thermistor (TH22)
Gas pipe thermistor (TH23)</td><td>Disconnect the connector, then measure the resistance using a tester.
(Sorrounding temperature 10˚C~30˚C[50˚F~86˚F])
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to the thermistor)</td></tr>
<tr><td>Transformer
 
</td><td>Disconnect the connector and measure the resistance using a tester.
<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>CNT(1)-(3)</td><td>App.45Ω</td><td rowspan="2">Open or short</td></tr><tr><td>CN3T(1)-(3)</td><td>App.1Ω</td></tr></table></td></tr>
<tr><td>Linear expansion valve
 
</td><td>Disconnect the connector then measure the resistance valve using a tester.
Refer to the next page for a detail.
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>(1)-(5)
White-Red</td><td>(2)-(6)
Yellow-Blown</td><td>(3)-(5)
Orange-Red</td><td>(4)-(6)
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">150Ω ±10%</td></tr></table></td></tr>
<tr><td>Fan motor
PDFY
P06~30NMU-E
 
</td><td>Measure the resistance between the terminals using a tester. (at 20˚C[68˚F])
<table><tr><th rowspan="2">Motor terminal
or
Relay connector</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>10,16</th><th>24~32</th></tr><tr><td>Orange-Gray</td><td>43.1Ω</td><td>40.5Ω</td><td rowspan="2">Open or short</td></tr><tr><td>Brack-Gray</td><td>53.6Ω</td><td>48.8Ω</td></tr></table></td></tr>
<tr><td>PDFY
P36·48NMU-E
 
</td><td>Measure the resistance between the terminals using a tester. (at 20˚C[68˚F])
<table><tr><th rowspan="2">Motor terminal
or
Relay connector</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>40</th><th>48</th></tr><tr><td>Gray-Orange</td><td>23.5Ω</td><td>16.45Ω</td><td rowspan="5">Open or short</td></tr><tr><td>Orange-Black</td><td>4.79Ω</td><td>8.30Ω</td></tr><tr><td>Black-Blue</td><td>6.78Ω</td><td>1.454Ω</td></tr><tr><td>Blue-Yellow</td><td>13.77Ω</td><td>7.94Ω</td></tr><tr><td>Yellow-Red</td><td>29.8Ω</td><td>21.9Ω</td></tr></table></td></tr>
</table>

<Thermistor Characteristic graph>

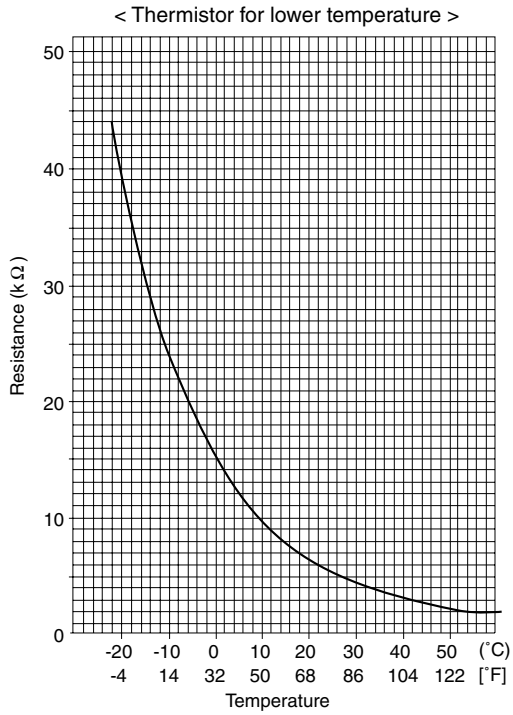
Thermistor for lower temperature

Room temparature thermistor(TH21)
Liquid pipe thermistor(TH22)
Gas pipe temparature thermistor(TH23)
Drain sensor(DS)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

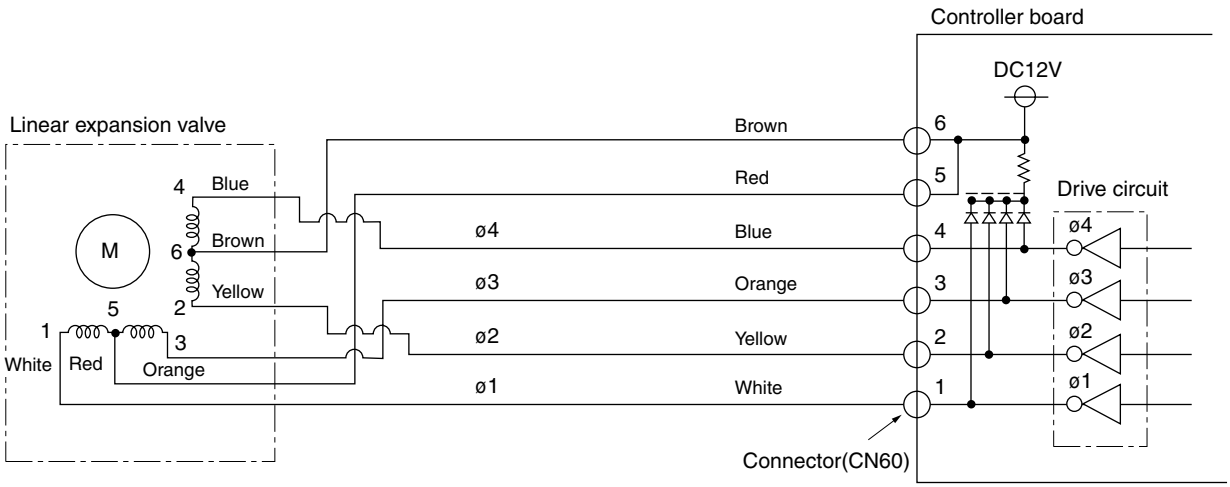
$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

0˚C	32˚F	15kΩ
10˚C	50˚F	9.6kΩ
20˚C	68˚F	6.3kΩ
25˚C	77˚F	5.2kΩ
30˚C	86˚F	4.3kΩ
40˚C	104˚F	3.0kΩ



Linear expansion valve

① **Operation summary of the linear expansion valve.**
• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the indoor controller board and the linear expasion valve>



<Output pulse signal and the valve operation>

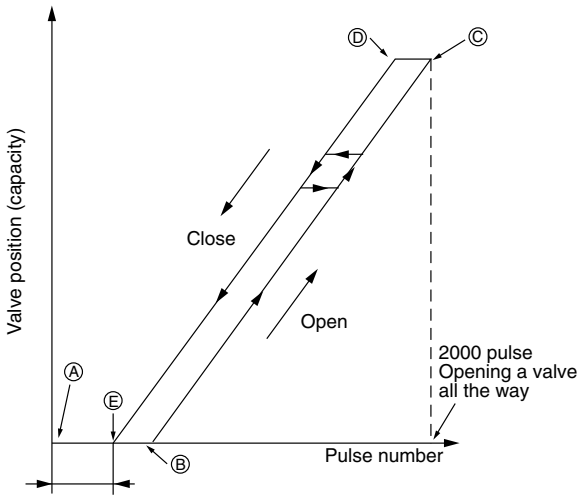
Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

The output pulse shifts in above order.

✻ 1. When linear expansion valve operation stops, all output phase become OFF.
2. At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will locks and vibrates.

② Linear expansion valve operation

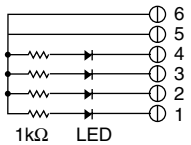
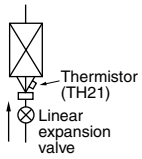


✻ When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

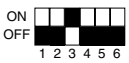
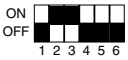
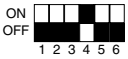
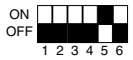
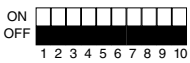
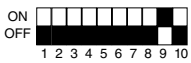
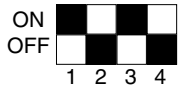
When the valve move smoothly, there is no noise or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more noise can be heard than normal situation.

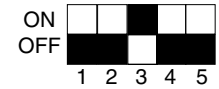
✻ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

③ Trouble shooting

Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor.	Disconnect the connector on the controller board, then connect LED for checking.  Pulse signal will be sent out for 10 seconds as soon as the main switch is turn on. If there is LED with lights on or lights off, it means the operation circuit is abnormal.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make ticking noise when motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion vale.
Short or breakage of the motor coil of the linear expansion valve.	Measure the resistance between the each coil (red-white, red-orange, brown-yellow, brown-blue) using a tester. It is normal if the resistance is in the range of 150Ω ± 10%.	Exchange the linear expansion valve.
Valve doesn´t close completely (thermistor leaking).	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there are some leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way. It is not necessary to exchange the linear expansion valve, if the leakage is small and not making any trouble.  	If large amount of refrigeration is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure.	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

<table>
<tr><th rowspan="2">Switch</th><th rowspan="2">Pole</th><th rowspan="2">Function</th><th colspan="2">Operation by switch</th><th rowspan="2">Remarks</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td rowspan="10">SW1
Mode
Selection</td><td>1</td><td>Thermistor<Intake temperature detection>position</td><td>Built-in remote controller</td><td>Indoor unit</td><td rowspan="10">Address board
<At delivery>

</td></tr>
<tr><td>2</td><td>Filter crogging detection</td><td>Provided</td><td>Not provided</td></tr>
<tr><td>3</td><td>Filter life</td><td>2,500hr</td><td>100hr</td></tr>
<tr><td>4</td><td>Air intake</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>5</td><td>Remote indication switching</td><td>Thermostat ON signal indication</td><td>Fan output indication</td></tr>
<tr><td>6</td><td>Humidifier control</td><td>Always operated while the heat is ON</td><td>Operated depends on the condition</td></tr>
<tr><td>7</td><td>Air flow st</td><td>Low</td><td>Extra low</td></tr>
<tr><td>8</td><td>Heat thermostat OFF</td><td>Setting air flow</td><td>Reset to SW1-7</td></tr>
<tr><td>9</td><td>Auto reset function</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>10</td><td>Power ON/OFF</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>SW2
Capacity
code
setting</td><td>1~6</td><td colspan="3"><table><tr><th>MODELS</th><th>SW2</th><th>MODELS</th><th>SW2</th><th>MODELS</th><th>SW2</th></tr><tr><td>PDFY-
P06NMU-E</td><td> 
</td><td>PDFY-
P18NMU-E</td><td>
</td><td>PDFY-
P36NMU-E</td><td>
</td></tr><tr><td>PDFY-
P08NMU-E</td><td>
</td><td>PDFY-
P24NMU-E</td><td>
</td><td>PDFY-
P48NMU-E</td><td>
</td></tr><tr><td>PDFY-
P12NMU-E</td><td> 
</td><td>PDFY-
P27NMU-E</td><td>
</td><td></td><td></td></tr><tr><td>PDFY-
P15NMU-E</td><td> 
</td><td>PDFY-
P30NMU-E</td><td> 
</td><td></td><td></td></tr></table></td><td>Indoor controller board
Set while the unit is off.
<At delivery>
Set for each capacity.</td></tr>
<tr><td>SW3
Function
Selection</td><td>1~10</td><td colspan="3"><table><tr><th>MODELS</th><th>SW3</th><th>MODELS</th><th>SW3</th></tr><tr><td>PDFY-
P06,08,12,18,24,27,
30,48NMU-E</td><td> 
</td><td>PDFY-P15,36
NMU-E</td><td> 
</td></tr></table></td><td>Indoor controller board
Set while the unit is off.</td></tr>
<tr><td>SW4
Unit
Selection</td><td>1~4</td><td colspan="3">P06~30
 

P36,48
 

<At delivery></td><td>Indoor controller board
Set while the unit is off.</td></tr>
</table>

Note :The DipSW setting is effective during unit stopping (remote controller OFF) for SW1,2,3 and 4 commonly and the power source is not required to reset.

<table>
<tr><th>Switch</th><th>Pole</th><th>Operation by switch</th><th>Remarks</th></tr>
<tr><td>SWA
Option

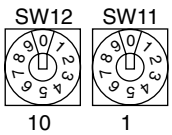
Note:1</td><td>1~3</td><td>
<table>
<tr><td>MODEL</td><td colspan="2">P06~12</td><td colspan="2">P15~24</td><td colspan="2">P27</td><td colspan="2">P30</td></tr>
<tr><td>VOLT</td><td>208</td><td>230</td><td>208</td><td>230</td><td>208</td><td>230</td><td>208</td><td>230</td></tr>
<tr><td>3 2 1 ■</td><td>0.321 in.WG (80Pa)</td><td>0.401 in.WG (100Pa)</td><td>0.200 in.WG (50Pa)</td><td>0.240 in.WG (60Pa)</td><td>0.120 in.WG (30Pa)</td><td>0.160 in.WG (40Pa)</td><td>—</td><td>—</td></tr>
<tr><td>3 2 ■ 1</td><td>0.200 in.WG (50Pa)</td><td>0.240 in.WG (60Pa)</td><td>0.321 in.WG (80Pa)</td><td>0.401 in.WG (100Pa)</td><td>0.200 in.WG (50Pa) / 0.321 in.WG (80Pa)</td><td>0.240 in.WG (60Pa) / 0.401 in.WG (100Pa)</td><td>0.200 in.WG (50Pa) / 0.401 in.WG (100Pa)</td><td>0.240 in.WG (60Pa) / 0.461 in.WG (115Pa)</td></tr>
<tr><td>3 2 1 ■</td><td>0.120 in.WG (30Pa)</td><td>0.160 in.WG (40Pa)</td><td>0.120 in.WG (30Pa)</td><td>0.160 in.WG (40Pa)</td><td>—</td><td>—</td><td>0.120 in.WG (30Pa)</td><td>0.160 in.WG (40Pa)</td></tr>
</table>
</td><td>Address board

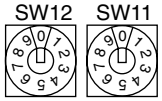
<At delivery>
3
2 ■
1</td></tr>
<tr><td>SWC
Option

Note:1</td><td>2</td><td>
<table>
<tr><td>MODEL</td><td colspan="2">P06~24</td></tr>
<tr><td>VOLT</td><td>208</td><td>230</td></tr>
<tr><td>Option ■
Standard</td><td>0.120 in.WG (30Pa)
0.200 in.WG (50Pa)
0.321 in.WG (80Pa)</td><td>0.160 in.WG (40Pa)
0.240 in.WG (60Pa)
0.461 in.WG (115Pa)</td></tr>
</table>
<table>
<tr><td>MODEL</td><td colspan="2">P27</td><td colspan="2">P30</td></tr>
<tr><td>VOLT</td><td>208</td><td>230</td><td>208</td><td>230</td></tr>
<tr><td>Option ■
Standard</td><td>0.120 in.WG (30Pa)
0.200 in.WG (50Pa)</td><td>0.160 in.WG (40Pa)
0.240 in.WG (60Pa)</td><td>0.120 in.WG (30Pa)
0.200 in.WG (50Pa)</td><td>0.160 in.WG (40Pa)
0.240 in.WG (60Pa)</td></tr>
<tr><td>Option ■
Standard</td><td>0.321 in.WG (80Pa)</td><td>0.401 in.WG (100Pa)</td><td>0.401 in.WG (100Pa)</td><td>0.461 in.WG (115Pa)</td></tr>
</table>
</td><td>Address board

<At delivery>
“オプション” (Option)
“標準” (Standard)</td></tr>
<tr><td>SW11
1st digit address setting

SW12
2nd degit address setting

Note:2</td><td>Rotary switch</td><td> 

Address setting should be done when network remote controller (PAR-F25MA) is being used.</td><td>Address board
Address can be set while the unit is stopped.
<At delivery>
 
</td></tr>
<tr><td>SW14
Connection No. setting

Note:2</td><td>Rotary switch</td><td>

This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.</td><td>Address board

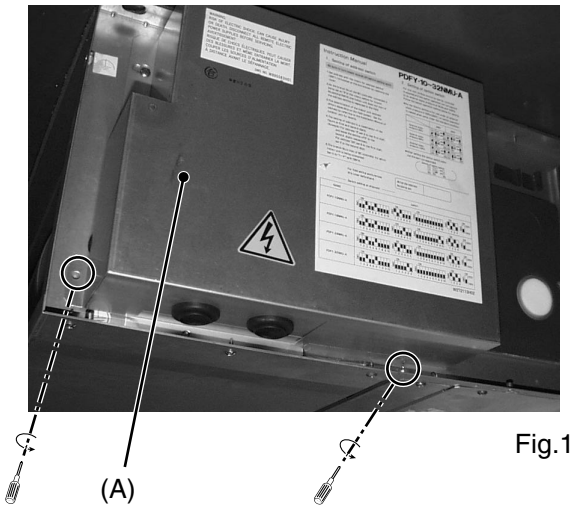
<At delivery>
</td></tr>
</table>

Note 1:The DipSW setting is effective always after powering (remote controller ON) for SWA and SWC.
2:The DipSW setting is effective during unit stopping (remote controller OFF) for SW11,12,14 and 5

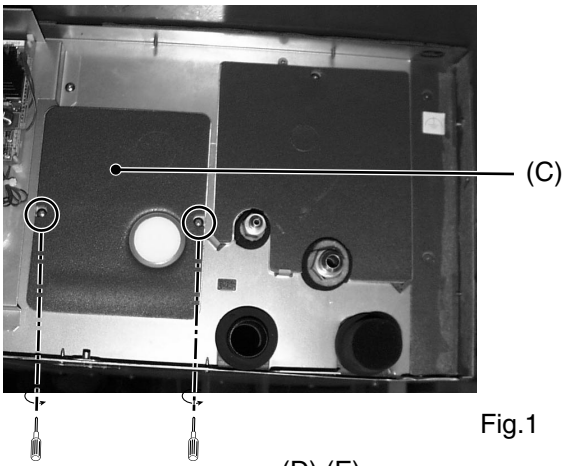
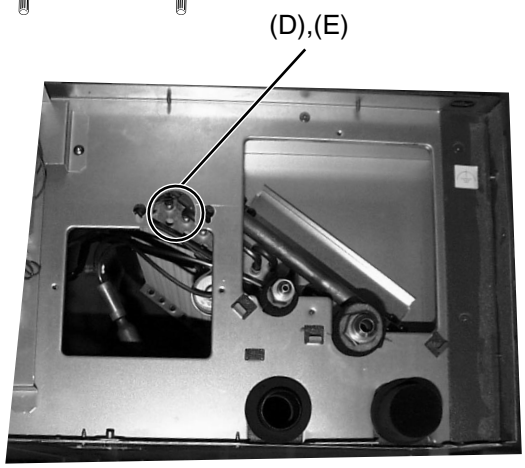
8 DISASSEMBLY PROCEDURE

8-1 CONTROL BOX

Be careful removing heavy parts.

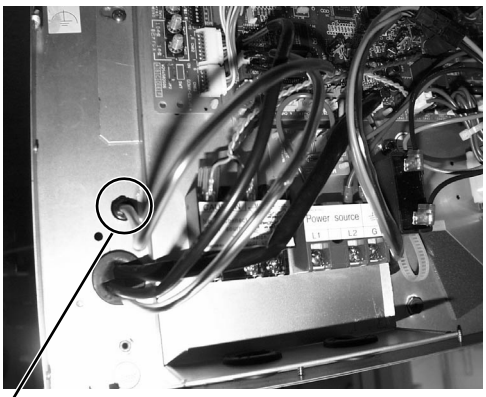
OPERATING PROCEDURE	PHOTOS
1.Removing the control box cover (1)Remove the fixing screws(two) of the cover(A) and remove the cover.	 Fig.1

8-2 THERMISTOR (Liquid piping temperature detection)

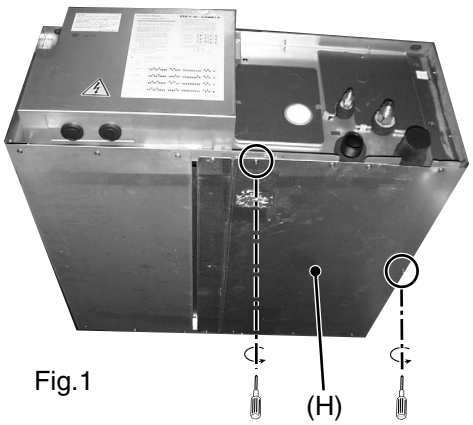
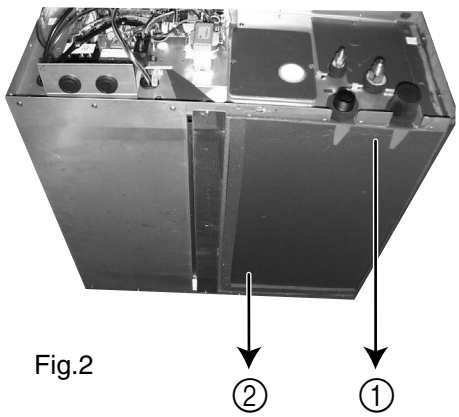
OPERATING PROCEDURE	PHOTOS
1.Removing the cover (1)Remove the fixing screws(two) of the cover(C) and remove the cover. **2.Removing the thermistor** (1)Remove the thermistor(D), from the thermistor holder(E), which are installed on the copper tube.	 Fig.1  Fig.2

8-3 THERMISTOR (Intake air temperature detection)

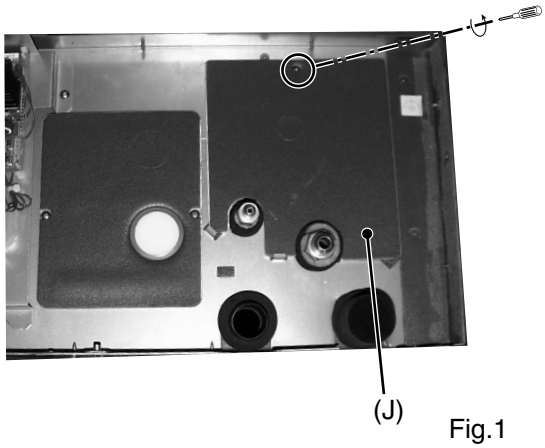
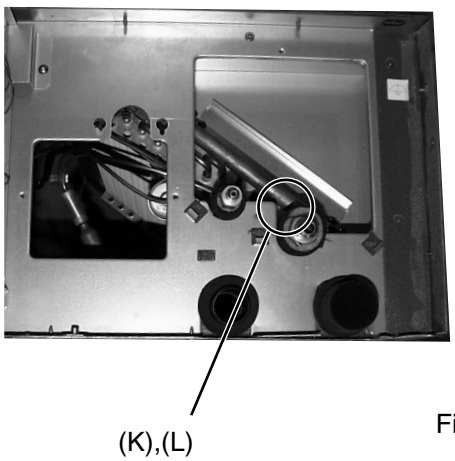
Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS
1.Removing the thermistor and thermistor holder (1)Pull out the thermistor holder(F) and thermistor (G) which are fixed the control box.	 (F),(G) Fig.1

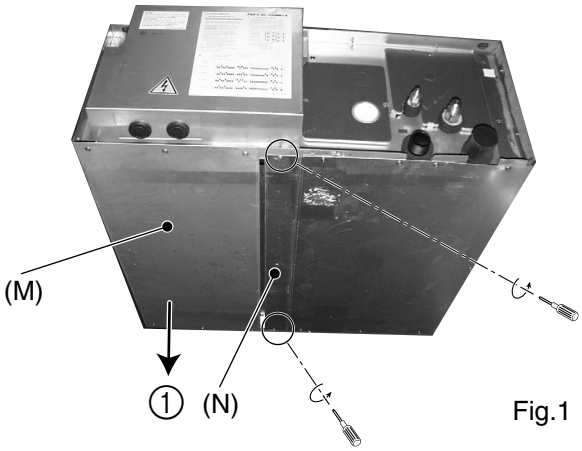
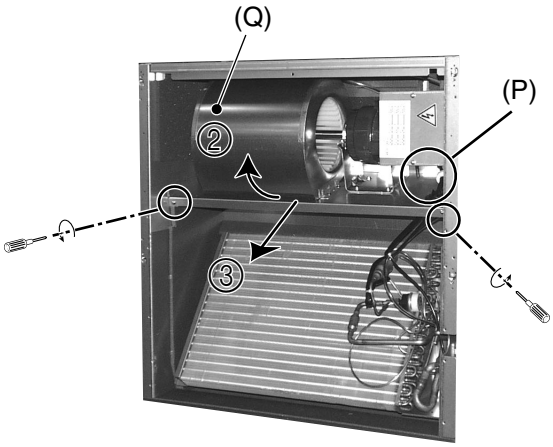
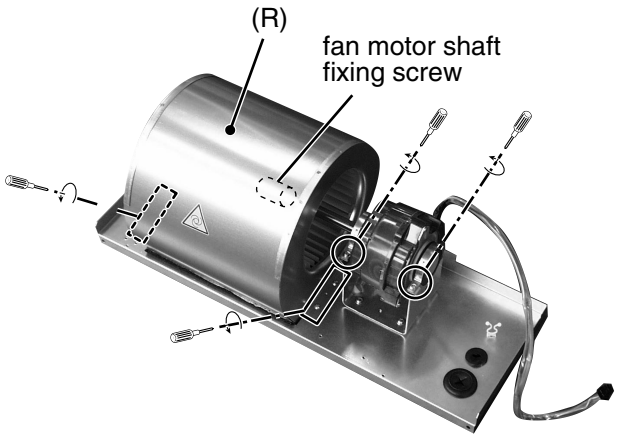
8-4 DRAINPAN

OPERATING PROCEDURE	PHOTOS
1.Removing the cover (1)Remove the fixing screws of the cover(H) and remove the cover. **2.Removing the drainpan** (1)Pull and remove the drainpan in the direction of the arrow ① and ② alternatively.	 Fig.1 (H)  Fig.2 ② ①

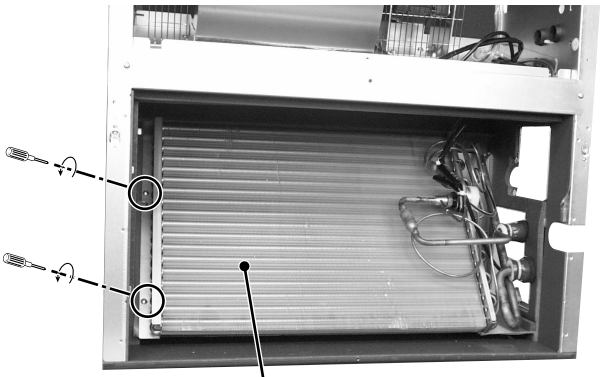
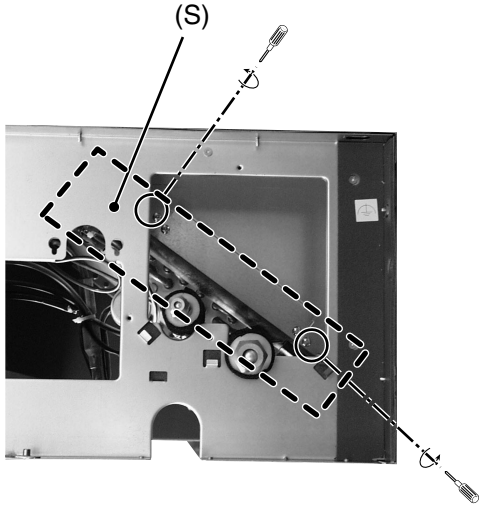
8-5 THERMISTOR (Gus piping temperature detection)

OPERATING PROCEDURE	PHOTOS
1.Removing the cover (1)Remove the fixing screw of the cover(J) and remove the cover. **2.Removing the thermistor** (1)Remove the thermistor(K), from the thermistor holder(L), which are installed on the copper tube.	 Fig.1  Fig.2

8-6 FAN and FAN MOTOR

OPERATING PROCEDURE	PHOTOS
1.Removing the filter (1)Press the tabs of the filter and remove the filter in the direction of the arrow ①. **2.Removing the bottom plate** (1)Remove the fixing screws (two) of the bottom plate(N) and remove the plate. **3.Removing the cable** (1)Remove the cable(P) threw the rubber bush. **4.Sliding the fan section** (1)Remove the fixing screws(two) of the fan base plate. (2)Pull up the fan section(Q) in direction of the arrow ② and slide the direction of the arrow ③. **5.Removing fan casing and sirroco fan** (1)Remove the fixing screws (four) of the fan casing(R). (2)Remove the fan motor shaft fixing screw and remove the fan casing(R) and sirroco fan. **6.Removing the fan motor** (1)Remove the condensor cable (in case of Model:PDFY-P36,P48NMU-E) (2)Remove the fixing screws of the motor fixtures (two) and remove the motor. Notice:Incase of the Model(PDFY-P15~P48NMU-E) stick out the motor shafts on both side of the motor.	 Fig.1  Fig.2  Fig.3

8-7 HEAT EXCHANGER

OPERATING PROCEDURE	PHOTOS
1.Removing the drainpan with procedure 8-4 **2.Removing the cover(J) with procedure 8-5** **3.Removing the Heat exchanger** (1)Remove the fixing screws of the heat exchanger(S) and remove the heat exchanger.	 Fig.1  (S) Fig.2

MITSUBISHI ELECTRIC CORPORATION

Issued in Aug. 2005 HWE05160

New publication, effective Aug. 2005
Specifications subject to change without notice

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